

Dell EMC ECS Object Storage with Video Management Systems

Surveillance

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Configuration Best Practices Guide

Abstract

The purpose of this guide is to provide configuration best practices for preparing Dell EMC ECS Object Storage for use with video management software (VMS) implementations that include both hardware and software elements.

Dell EMC Solutions



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Solution overview

This guide is intended for internal Dell EMC personnel and qualified Dell EMC partners. It provides configuration instructions for preparing storage systems for use with video management software (VMS).

The purpose of this guide is to help users understand the configuration best practices for ECS Object Storage (ECS) for video surveillance specific implementations that include both hardware and software elements. This guide is not a replacement for Dell EMC product implementation guides.

Assumptions

This solution assumes that internal Dell EMC personnel and qualified Dell EMC partners are using this guide with an established architecture.

This guide assumes that the Dell EMC partners who intend to deploy this solution are:

- Associated with product implementation
- VMS (partner)-certified to install VMS (long) services
- Familiar with installing and configuring VMware hypervisors and the appropriate operating system, such as Microsoft Windows or a Linux distribution

The configurations that are documented in this guide are based on tests that we conducted in the Dell EMC Surveillance Lab using worst-case scenarios to establish a performance baseline. Lab results might differ from individual production implementations.

Dell EMC ECS

Dell EMC ECS is a complete software-defined cloud storage platform that supports the storage, manipulation, and analysis of video surveillance and unstructured data on a massive scale on commodity hardware. ECS is specifically designed to support the mobile, cloud, and Big Data workloads that are similar to large-scale surveillance workloads.

Retention periods and policies

ECS provides the ability to prevent data from being modified or deleted within a specified retention period. Bucket based retention is not supported and should not be used with any VMS when using the CIFS-ECS service. VMS managed time based retention is the only supported retention policy when using CIFS-ECS.

Cluster Capacity

Dell EMC only supports the use of time based retention settings with the VMS. To determine the capacity requirement for each recorder, calculate the number of cameras per recorder, the target bit rate per camera, and the retention time in days. Always consult with the VMS ISV to determine an accurate capacity estimate.

All writes to the ECS cluster stop when the cluster capacity reaches 90% full. It is always recommended to plan for additional capacity as soon as you reach 75% of the cluster capacity.

Quotas

When using CIFS-ECS, Dell EMC requires the use of ECS soft quotas. Quotas are the storage space limit that is specified for the ECS buckets. You can specify a storage limit for the bucket and define notification and access behavior when the quota is reached. The quota setting for a bucket cannot be less than 1 GB and can be specified in increments of 1 GB.

Dell EMC only supports soft quotas. It is recommended to have 15% overhead beyond the capacity requirement.

The quota behavior options are as follows:

Notification Only at *<quota_limit_in_GB>*

Soft quota setting at which you are notified.

Block Access Only at *<quota_limit_in_GB>*

Hard quota setting which, when reached, prevents write/update access to the bucket.

Block Access at *<quota_limit_in_GB>* and

Hard quota setting which, when reached, prevents write/update access to the bucket.

Send Notification at *<quota_limit_in_GB>*

Quota setting at which you are notified that the write/update access is blocked.

Garbage collection

Garbage collection in ECS is designed such that it runs with lower priority than input/output activity. When an object is deleted, ECS waits for garbage collection to reclaim the space allocated to that object. However, the object is marked as deleted and the deletion is reflected in the user's view of system utilization through metering and chargeback reports.

An object maps to a set of chunks as all data is stripped and spread across the chunks during data ingest. Therefore, a single object and its metadata could span multiple data chunks and metadata chunks. Each chunk has a logical volume of 128 MB. Processing a delete requires updates to the object index as well as the chunk index. Garbage collection verification is performed to ensure that all object references to a chunk have been removed before it is marked for reclamation. Chunks that pass the verification are then reclaimed through the garbage collection process.

There two types of garbage collection, Repo GC and Btree GC. Each has two types of GC Full GC and partial GC. Full GC is when chunk has no references of objects - it is eligible for full GC. When more than 2/3 of the chunk is garbage, garbage collection does not wait until the remaining 1/3 becomes garbage before processing. Partial GC frees up the chunk by merging valid data of such chunks.

To protect users from data loss in the event of accidental deletion, the steps in the deletion and space reclamation process are not performed in quick succession.

Dell EMC recommends tuning the garbage collection process for video surveillance workloads to achieve faster space reclamation. The parameters to tune are:

- Decrease the time interval for the frequency of verification scanner
- Increase the scanner throttle for number of objects

- Increase the scan tasks expiration times
- Increase the maximum number of pending partial GC tasks

Please contact Dell EMC ECS technical support for more information about tuning these parameters.

CIFS-ECS tool

Refer to the [Dell EMC CIFS-ECS Tool User Guide](#) for information about installation and configuration of CIFS-ECS tool on the recorder.

Summary

The Dell EMC Surveillance Lab performed comprehensive testing with multiple VMS vendors against Dell EMC ECS Object Storage.

ECS storage

Dell EMC ECS is a software-defined, cloud-scale, object storage platform that combines the cost advantages of commodity infrastructure with the reliability, availability and serviceability of traditional arrays. With ECS, any organization can deliver scalable and simple public cloud services with the reliability and control of a private-cloud infrastructure.